

Listing of Claims:

This listing of Claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (previously presented):

A method for preventing to form a spacer undercut in SEG Pre-clean process, comprising:

providing a semiconductor substrate;

forming a gate structure on said semiconductor substrate;

forming a spacer of double-film structure on a side-wall of said gate structure, wherein said spacer of double-film structure comprises a first spacer and a second spacer, said first spacer being formed between said side-wall of said gate structure and said second spacer;

removing a portion of a surface of said semiconductor substrate by using a DHF (hydrofluoric acid diluted in deionized water) solution to remove a native oxide layer on said surface of said semiconductor substrate; and

etching said first spacer and said second spacer, wherein an etching rate of said second spacer is faster than an etching rate of said first spacer.

Claim 2 (canceled)

Claim 3 (previously presented):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 1, wherein a volume ratio for hydrofluoric acid to deionized water is about 1:10- 1:100 in said DHF solution.

Claim 4 (previously presented):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 1, wherein etching said first spacer and said second spacer comprises a HFEG (HF diluted by ethylene glycol) solution is utilized.

Claim 5 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 4, wherein a volume ratio for hydrofluoric acid to ethylene glycol is 0-4% in said HFEG solution.

Claim 6-7 (canceled)

Claim 8 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 1, wherein said first spacer comprises silicon dioxide.

Claim 9 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 8, wherein said second spacer comprises silicon nitride.

Claim 10-18 (canceled)

Claim 19 (previously presented):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 1, wherein formation of said raised source/drain is formed by selective epitaxial growth (SEG) method.

Claim 20 (currently amended):

A method for preventing to form a spacer undercut in SEG Pre-clean process, comprising:

providing a semiconductor substrate;

forming a gate structure on said semiconductor substrate, wherein said gate structure comprises a gate oxide and a polysilicon gate electrode, said polysilicon gate electrode on said gate oxide;

forming a first spacer comprises silicon dioxide on a side-wall of said polysilicon gate electrode and said gate oxide;

forming a second spacer comprises silicon nitride on a side-wall of said first spacer;

~~performing a first Pre-clean process, using a DHF solution to clean a surface of said semiconductor substrate;~~

performing a ~~second~~ HFEG Pre-clean process, using a HFEG solution to clean a portion of said surface of said semiconductor substrate and a portion of said first spacer and a portion of said second spacer ; and forming a raised source/drain on said surface of said semiconductor substrate.

Claim 21 (canceled)

Claim 22 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 20, wherein a volume ratio for hydrofluoric acid to ethylene glycol is 0-4% in said HFEG solution.

Claim 23 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 20, wherein said raised source/drain is formed by selective epitaxial growth (SEG) method.

Claim 24 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 23, wherein said selective epitaxial growth (SEG) method for said raised source/drain is selected from a group consisting of low pressure chemical vapor deposition and ultra-high vacuum chemical vapor deposition.

Claim 25 (original):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 23, wherein said raised source/drain comprises epitaxial silicon.

Claim 26 (new):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 20 further comprising a step of performing a DHF Pre-clean process by using a DHF solution to clean a surface of said semiconductor substrate.

Claim 27 (new):

The method for preventing to form a spacer undercut in SEG Pre-clean process according to claim 26, wherein a volume ratio for hydrofluoric acid to deionized water is about 1:10-1:100 in said DHF solution